IS 10986 : 2013
ISO 6104 : 2005
(Superseding IS 13564 : 1993)

भारतीय मानक

अधि अपघर्षी उत्पाद — डायमण्ड या क्यूबिक बोरोन नाइट्राईड वाले घूर्णी घिसाई औजार — सामान्य सर्वेक्षण, अभिनाम एवं बहुभाषी नामावली

(पहला पुनरीक्षण)

Indian Standard

SUPERABRASIVE PRODUCTS — ROTATING GRINDING TOOLS WITH DIAMOND OR CUBIC BORON NITRIDE — GENERAL SURVEY, DESIGNATION AND MULTILINGUAL NOMENCLATURE

(First Revision)

ICS 25.100.70

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

February 2013 **Price Group 6**

Abrasives Sectional Committee, PGD 09

NATIONAL FOREWORD

This Indian Standard (First Revision) which is identical with ISO 6104 : 2005 'Superabrasive products — Rotating grinding tools with diamond or cubic boron nitride — General survey, designation and multilingual nomenclature' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Abrasives Sectional Committee and approval of the Production and General Engineering Division Council.

This standard was originally published as IS 13564 : 1993 'Recommendations for selection of diamond and cubic boron nitride grinding wheels'. The Committee then decided to adopt IS 10986 : 2012 'General survey, designation and nomenclature of diamond or cubic boron nitride grinding wheels and saws' identical with ISO 6104 : 1979 under dual numbering system to make pace with the latest development that have taken place at international level. This standard is now being revised to harmonize it with the latest version of ISO 6104 : 2005.

This standard supersedes IS 13564 : 1993. After the publication of this standard IS 13564 : 1993 shall be treated as withdrawn.

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain terminology and conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker, while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SUPERABRASIVE PRODUCTS — ROTATING GRINDING TOOLS WITH DIAMOND OR CUBIC BORON NITRIDE — GENERAL SURVEY, DESIGNATION AND MULTILINGUAL NOMENCLATURE

(First Revision)

1 Scope

This International Standard gives a general survey, and specifies the designation, of rotating grinding tools with diamond or cubic boron nitride superabrasive section. It also gives a multilingual nomenclature concerning these tools.

NOTE In addition to terms in English and French, two of the three official ISO languages, this International Standard gives the equivalent terms in German; these terms are published under the responsibility of the member body for Germany (DIN). However, only the terms given in the official language can be considered as ISO terms.

2 Terms and dimensional abbreviations

See Annex A.

3 Designation

3.1 Structure of designation

3.1.1 Elements

The structure of designation comprises three symbols intended only for the designation of the rotating grinding wheel and cutting-off wheels (saws). The three symbols shall be included in any designation. A supplementary symbol may be used if necessary.

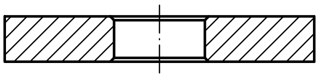
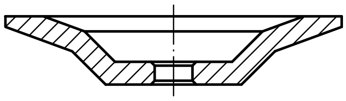
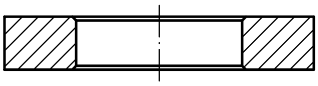
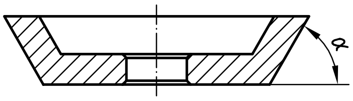
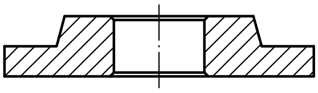
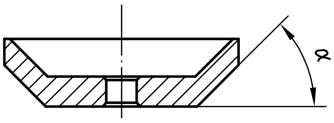
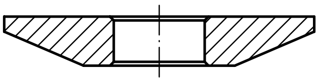
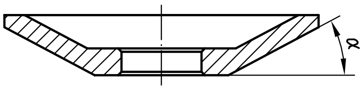
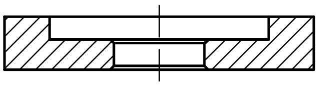
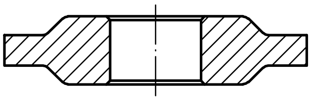
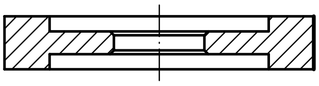
The meaning of these symbols is the following:

- digit or characteristic number for the basic core shape on which the superabrasive section is mounted (see 3.1.2);
- one- or two-letter symbols for the shape or superabrasive section (see 3.1.3);
- digit or characteristic number for location of the superabrasive section on the core (see 3.1.4);
- possibly, one or several letter symbols for the core modifications (see 3.1.5).

3.1.2 Basic core shape

Basic core shapes are defined by symbols irrespective of their location of the superabrasive section on the core and the end use of the rotating grinding tools. The presence of a recess in the core to accommodate the superabrasive section does not affect the determination of the symbol. For basic core shapes, see Table 1.

Table 1 — Basic core shapes

Core shape	Designation	Illustration	Core shape	Designation	Illustration
1	Straight peripheral wheel		10	Concave double-angle cup wheel	
2	Face or rim wheel		11	Taper cup wheel	 $\alpha > 60°$
3	Single hubbed wheel		12	Taper cup wheel	 $30° < \alpha \leqslant 60°$
4	Wheel tapered one side		13	Taper cup wheel	 $\alpha \leqslant 30°$
6	Straight cup wheel		14	Double hubbed wheel	
9	Double cup wheel		—		

3.1.3 Shape of superabrasive section

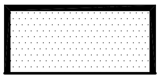
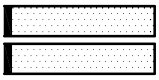
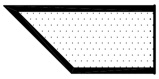
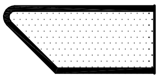
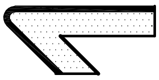
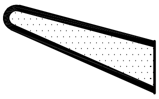
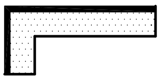
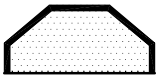
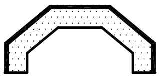
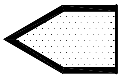
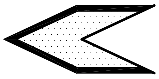
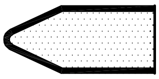
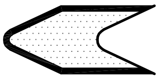
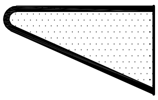
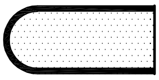
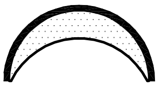
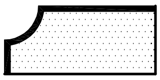
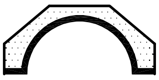
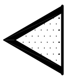
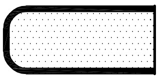
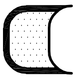
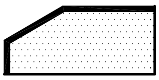
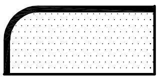
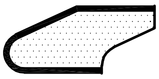
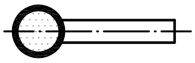
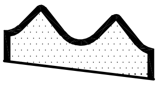
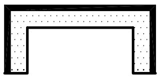
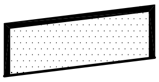
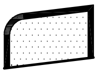
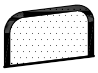
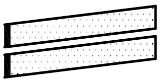
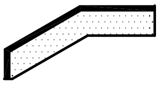
Superabrasive section shapes and their codes are shown and indicated in Table 2.

— Code is irrespective of the location of the superabrasive section.

— The superabrasive section can be at any position relative to the core.

— The bold black lines in the drawings indicate the grinding face.

Table 2 — Superabrasive section shapes and codes

A 	**AA** 	**B** 	**BF** 
BH 	**BT** 	**C** 	**D** 
DD 	**E** 	**EE** 	**EF** 
EH 	**ET** 	**F** 	**FF** 
G 	**J** 	**K** 	**L** 
LL 	**M** 	**Q** 	**QV** 
R 	**S** 	**U** 	**V** 
VF 	**VL** 	**V V** 	**Y** 

NOTE The most common shapes are shown.

3.1.4 Location of superabrasive section on core

See Table 3.

Table 3 — Location of the superabrasive section on the core

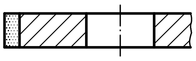
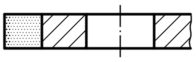
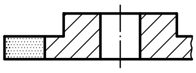
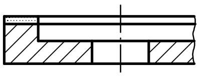
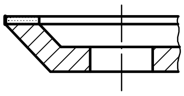
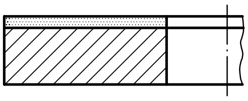
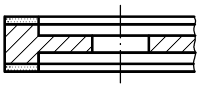
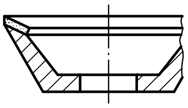
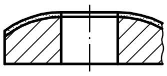
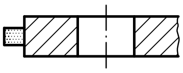
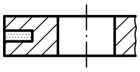
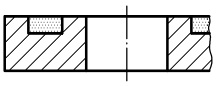
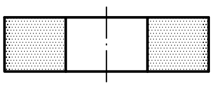
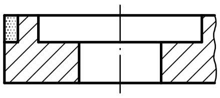
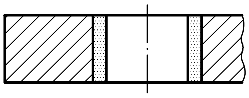
No.	Location	Description	Shape
1	Periphery	The superabrasive section is placed on the periphery of the core and extends over the full thickness of the wheel. The axial length of this section may be greater than, equal to, or less than the depth of diamond or CBN, measured radially. One or more hubs are not added to the wheel thickness for the purpose of this description.	  
2	One side	The superabrasive section is placed on the side of the wheel and the length of the superabrasive section extends from the periphery towards the centre. It may or may not include the entire side.	  
3	Both sides	The superabrasive sections are placed on both sides of the wheel and extend from the periphery towards the centre. They may or may not include the entire sides.	
4	Concave or arc	This description applies to the general wheel types 2, 6, 10, 11, 12 or 13, and locates the superabrasive section on the side wall. This wall has an angle or arc extending from a higher point at the wheel periphery to a lower point towards the wheel centre.	
5	Convex or arc	This description applies to the general wheel types 2, 6 and 11, and locates the superabrasive section on the side wall. This wall has an angle or arc extending from a lower point at the wheel periphery to a higher point toward the wheel centre.	
6	Part of periphery	The superabrasive section is placed on the periphery of the core but does not extend over the full thickness of the wheel and does not reach to either side.	 
7	Part of side	The superabrasive section is placed on the side of the core and does not extend to the wheel periphery. It may or may not extend to the centre.	
8	Throughout	No core, superabrasive wheel consists of solid superabrasive section.	

Table 3 (*continued*)

No.	Location	Description	Shape
9	Corner	This description is of a location which would commonly be considered to be on the periphery, except that the superabrasive section is on one corner but does not extend to the other corner.	
10	Annular	This description is of a location of the superabrasive section on the inner annular of the wheel.	

3.1.5 Modification of basic core shapes

Modifications that are made to basic core shapes are optional within the meaning of the descriptions given in Table 4.

Table 4 — Modification to basic core shapes

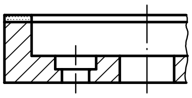
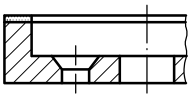
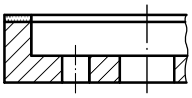
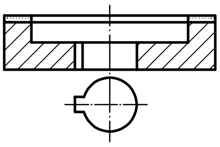
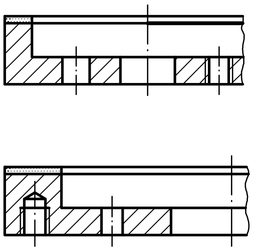
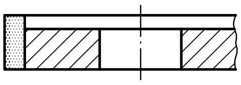
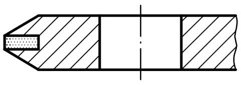
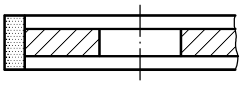
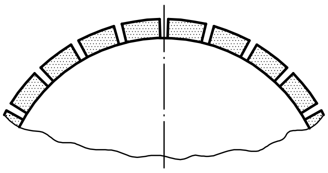
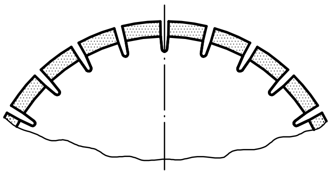
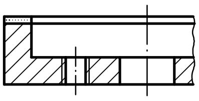
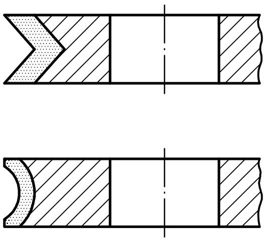
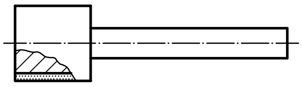
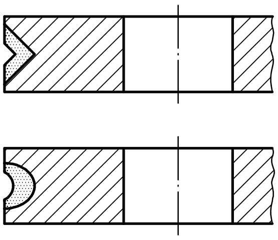
Abbreviation	Description	Shape
B	Holes drilled and counterbored in core	
C	Holes drilled and countersunk in core	
H	Straight holes drilled in core	
K	Hole with keyway in core	
M	Mixed holes, some plain, some threaded, in the core	

Table 4 (*continued*)

Abbreviation	Description	Shape
P	Relief on one side of the wheel, thickness of core less than wheel thickness	
Q	Three surfaces of superabrasive section partially or wholly enclosed by the core	
R	Relief on both sides of superabrasive wheel. The thickness of the core is less than the wheel thickness.	
S	The cutting off wheel (saw) has a section which is interrupted by grooves and applied to a core with solid rim (clearance between segments has no bearing on definition).	
SS	The cutting-off wheel (saw), with segments mounted on solid and slotted core rim	
T	Threaded holes in core	
V	The superabrasive cross section is considered inverted if mounted on the core so that the interior point of any angle or the concave side of any arc is exposed.	
W	Superabrasive section core and mounting shaft cannot be dismounted	
Y	See descriptions for Q and V.	

3.2 Complete designation

The complete designation of rotating grinding wheels with diamond or cubic boron nitride shall comprise the following indications in the order given:

a) designation of the rotating grinding wheel corresponding to Table 1 and Annex B;

b) number block corresponding of this International Standard, i.e. ISO 6104;

c) basic core shape, in accordance with 3.1.2;

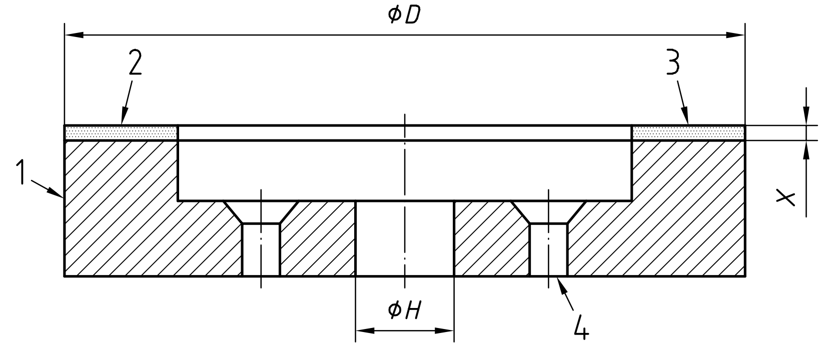
d) shape of the superabrasive section, in accordance with 3.1.3;

e) location of superabrasive section on the core, in accordance with 3.1.4;

f) any modification(s) carried out to the basic core shapes, in accordance with 3.1.5;

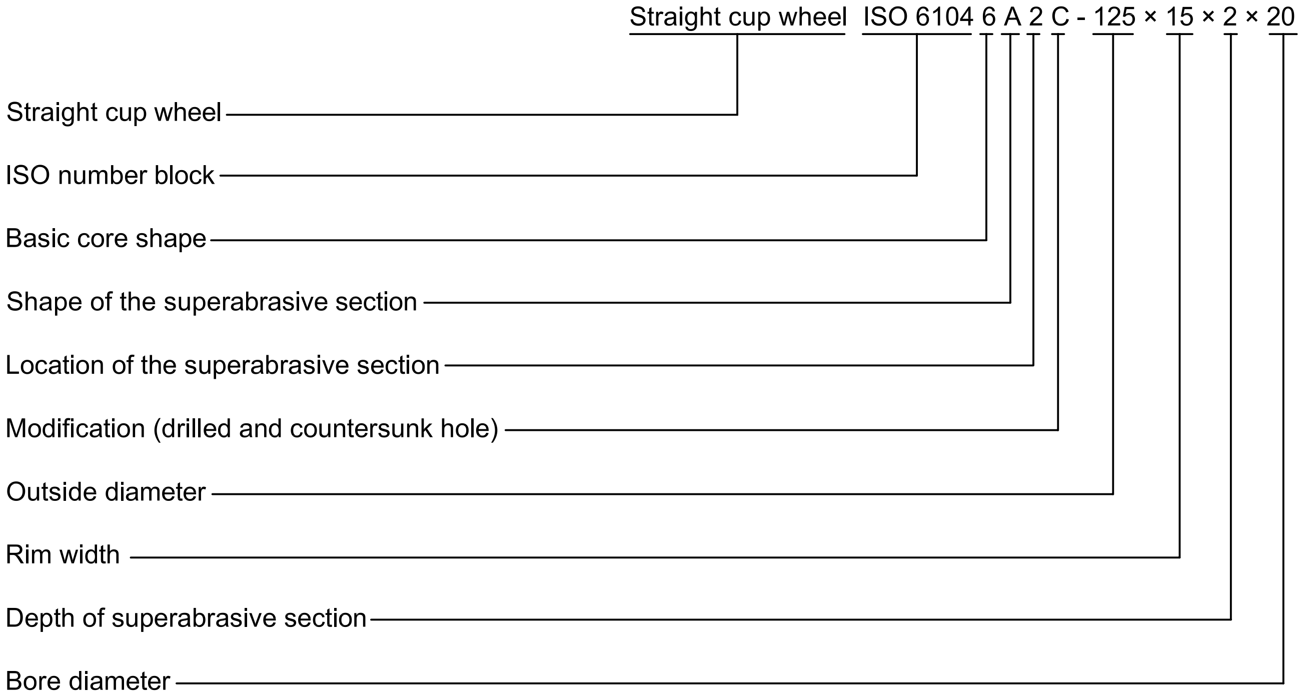
g) nominal dimensions provided by the manufacturer.

EXAMPLE



Key

1 core shape
2 shape of diamond or CBN section
3 location of diamond or CBN section
4 modification (drilled and countersunk hole)


Straight cup wheel ISO 6104 6 A 2 C - 125 × 15 × 2 × 20
Straight cup wheel
ISO number block
Basic core shape
Shape of the superabrasive section
Location of the superabrasive section
Modification (drilled and countersunk hole)
Outside diameter
Rim width
Depth of superabrasive section
Bore diameter

Annex A
(informative)

Dimensional abbreviations and terms

Table A.1 — Dimensional abbreviations and terms
[in English (en), French (fr) and German (de)]

Symbol	Language Langue Sprache	Term Terme Benennung
D	en	Outside diameter
	fr	Diamètre extérieur
	de	Außendurchmesser
E	en	Thickness of a wheel, dish wheel and a recessed or relieved wheel, thickness of a blank
	fr	Épaisseur de meule, meule assiette et meule à embrèvement ou à dépouille, épaisseur de l’âme
	de	Bodendicke von Schleiftöpfen und –tellern sowie ausgesparten und verjüngten Schleifscheiben, Dicke des Stammblattes
H	en	Bore diameter
	fr	Diamètre de l'alésage
	de	Bohrungsdurchmesser
J	en	Smallest diameter of tapered cup, dish or tapered wheel
	fr	Petit diamètre des meules boisseaux coniques, des meules assiettes ou des meules coniques
	de	Kleinerer Durchmesser bei kegeligen Schleiftöpfen, Schleiftellern, konischen und abgesetzten Schleifscheiben
K	en	Internal diameter of recess on tapered cup or dish wheel
	fr	Diamètre intérieur de l’embrèvement des meules boisseaux coniques ou des meules assiettes
	de	Innendurchmesser von kegeligen Schleiftöpfen und Schleiftellern, Durchmesser der Verjüngung von Schleifscheiben
L	en	Overall length of mounted point
	fr	Longueur hors tout de la meule sur tige
	de	Gesamtlänge bei Schleifstiften
L_1	en	Length of segment, spindle length of mounted point
	fr	Longueur de segment, longueur de la tige de la meule sur tige
	de	Länge des Schleifsegmentes, Schaftlänge bei Schleifstiften
L_4	en	Reduced length of spindle of mounted point
	fr	Longueur de la tige décolletée de la meule sur tige
	de	Länge der Absetzung des Schaftes bei Schleifstiften

Table A.1 *(continued)*

Symbol	Language Langue Sprache	Term Terme Benennung
R	en	Radius
	fr	Rayon
	de	Radius
S_d	en	Spindle diameter of mounted point
	fr	Diamètre de la tige de la meule sur tige
	de	Schaftdurchmesser bei Schleifstiften
S_1	en	Diameter of reduced spindle of mounted point
	fr	Diamètre de la tige décolletée de la meule sur tige
	de	Durchmesser der Absetzung bei Schleifstiften
T	en	Overall thickness
	fr	Épaisseur hors tout
	de	Gesamtbreite
U	en	Thickness of superabrasive section (if less than T or T_1)
	fr	Épaisseur de la couche abrasive (si inférieure à T ou à T_1)
	de	Belagbreite (wenn kleiner als T oder T_1)
W	en	Rim width
	fr	Largeur de la partie travaillante
	de	Schleifrandbreite
X	en	Useable depth of superabrasive section
	fr	Profondeur de la couche abrasive
	de	Nutzbare Schleifbelagdicke
X_1	en	Overall depth section
	fr	Profondeur hors tout de la couche abrasive
	de	Gesamtschleifbelagdicke
α	en	Angle with the body of guiding wheel
	fr	Angle avec le corps de meule de guidage
	de	Grundkörperwinkel
β	en	Offset basic core angle
	fr	Angle d’alésage de base du déport
	de	Abgesetzter Grundkörperwinkel

Annex B
(informative)

General survey and dimensional abbreviations

Examples of grinding wheels and mounted points are given in Tables B.1 and B.2

Table B.1 — Examples of grinding wheels

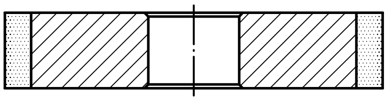
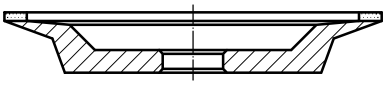
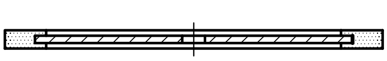
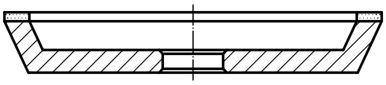
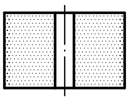
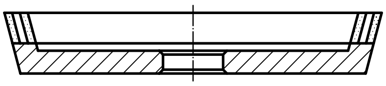
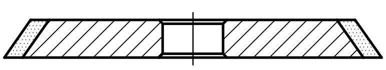
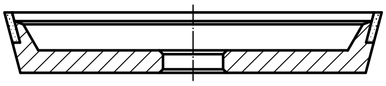
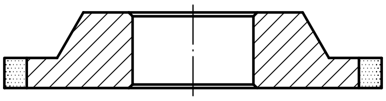
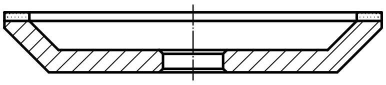
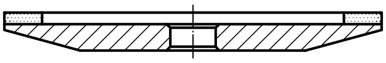
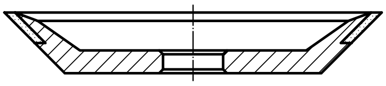
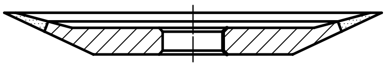
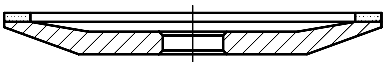
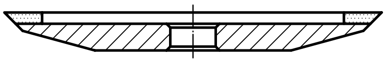
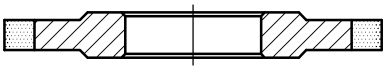
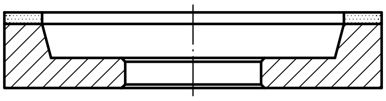
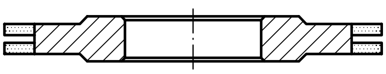
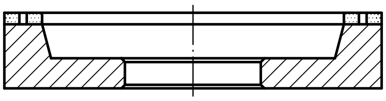
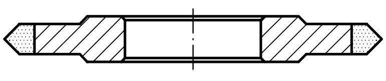
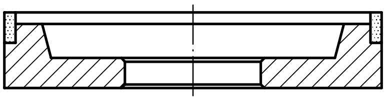
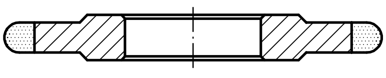
Core shape	Sketch	Core shape	Sketch
1A1		**10A2**	
1A1R		**11A2**	
1A8		**11VV2**	
1V1		**11V9**	
3A1		**12A2**	
4A2		**12V9**	
4BT9		**13A2**	
4V2		**14A1**	
6A2		**14AA1**	
6AA2		**14E1**	
6A9		**14F1**	

Table B.1 *(continued)*

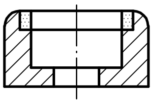
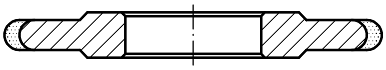
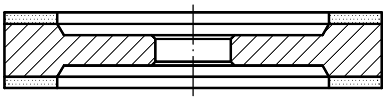
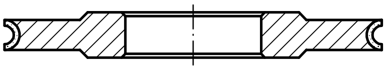
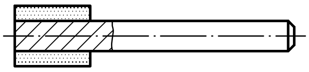
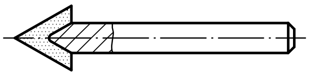
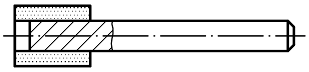
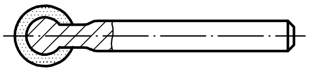
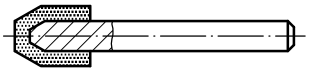
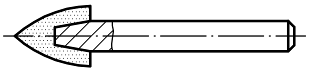
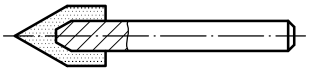
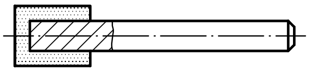
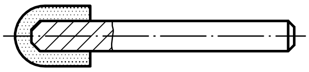
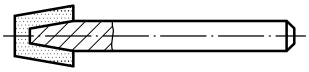
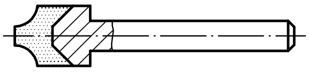
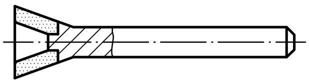
Core shape	Sketch	Core shape	Sketch
6A10		14FF1	
9A3		14FF6Y	

Table B.2 — Examples of mounted points

Core shape	Sketch	Core shape	Sketch
1A1W		1K1W	
1A1PW		1R1W	
1D1W		1T1W	
1E1W		1U1W	
1F1W		1V1W	
1G1W		11V2W	

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Amendments Issued Since Publication

Amendment No.	Date of Issue	Text Affected

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